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G1G GSA
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INT CL[5] G01H , G07C 13/00
Online database: WPI

(54) Audible audience response measuring device

(57) The device is for determining the audible audience response to a given performance wherein said response is analysed in order to determine, for example, the clapping content of said response for the purpose of scoring a talent competition. The invention has particular application in the scoring of karaoke talent competitions and includes a number of visual display means so that audience response can be visualised in real time.

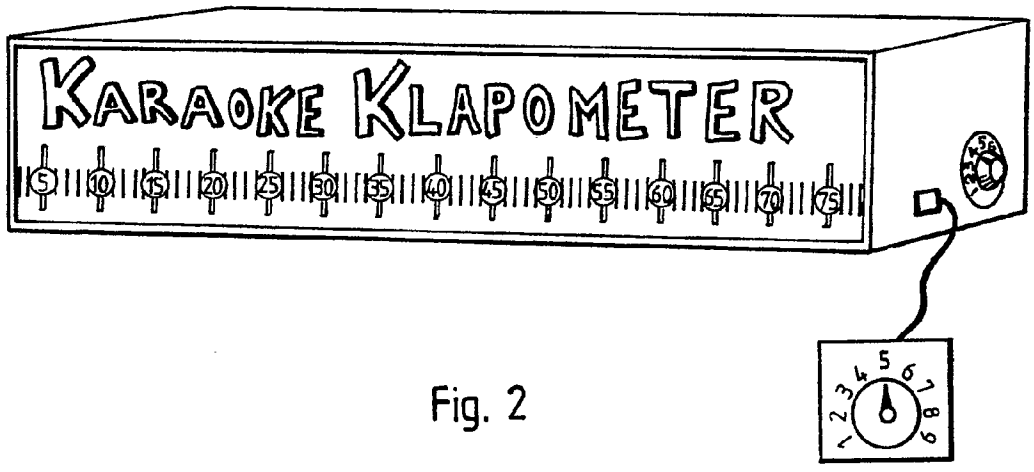

Fig. 2

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1990.

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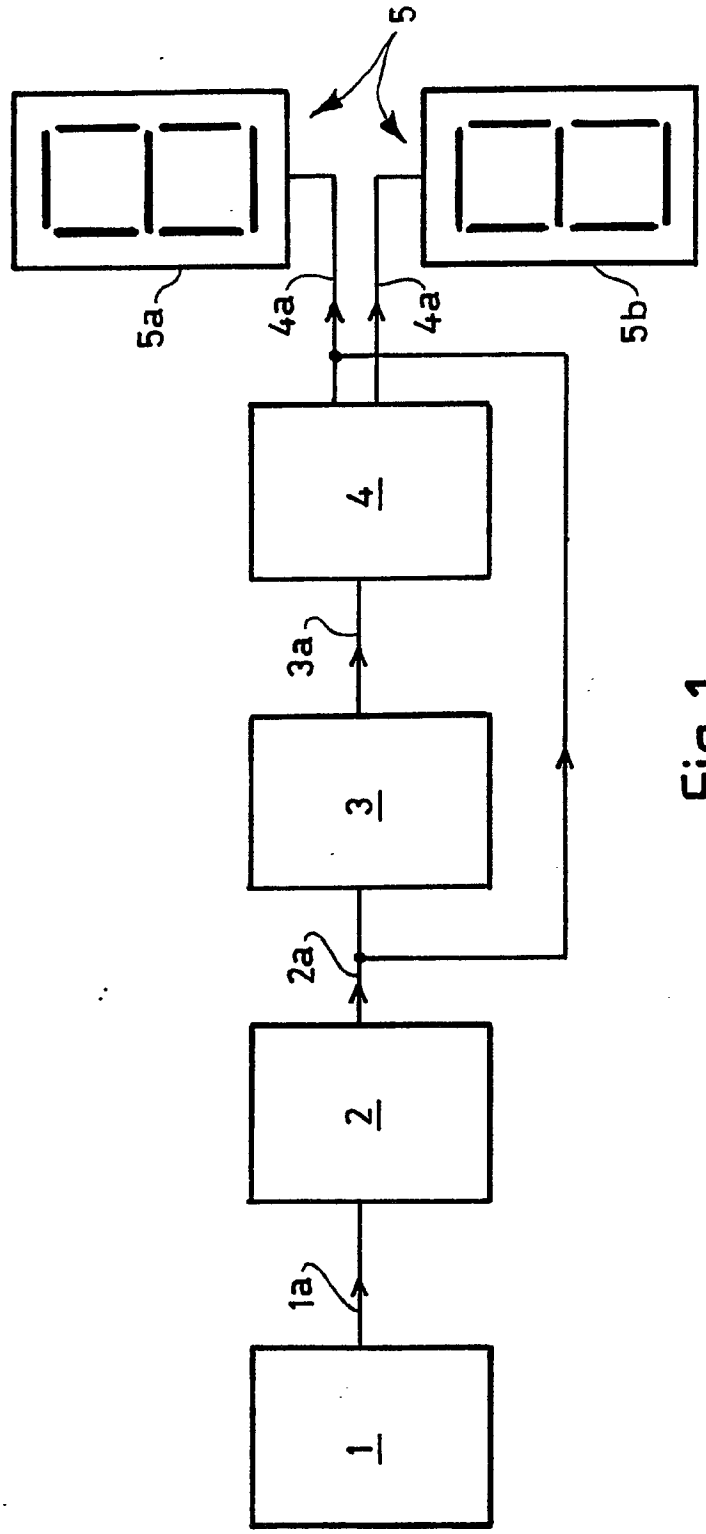

Fig.1

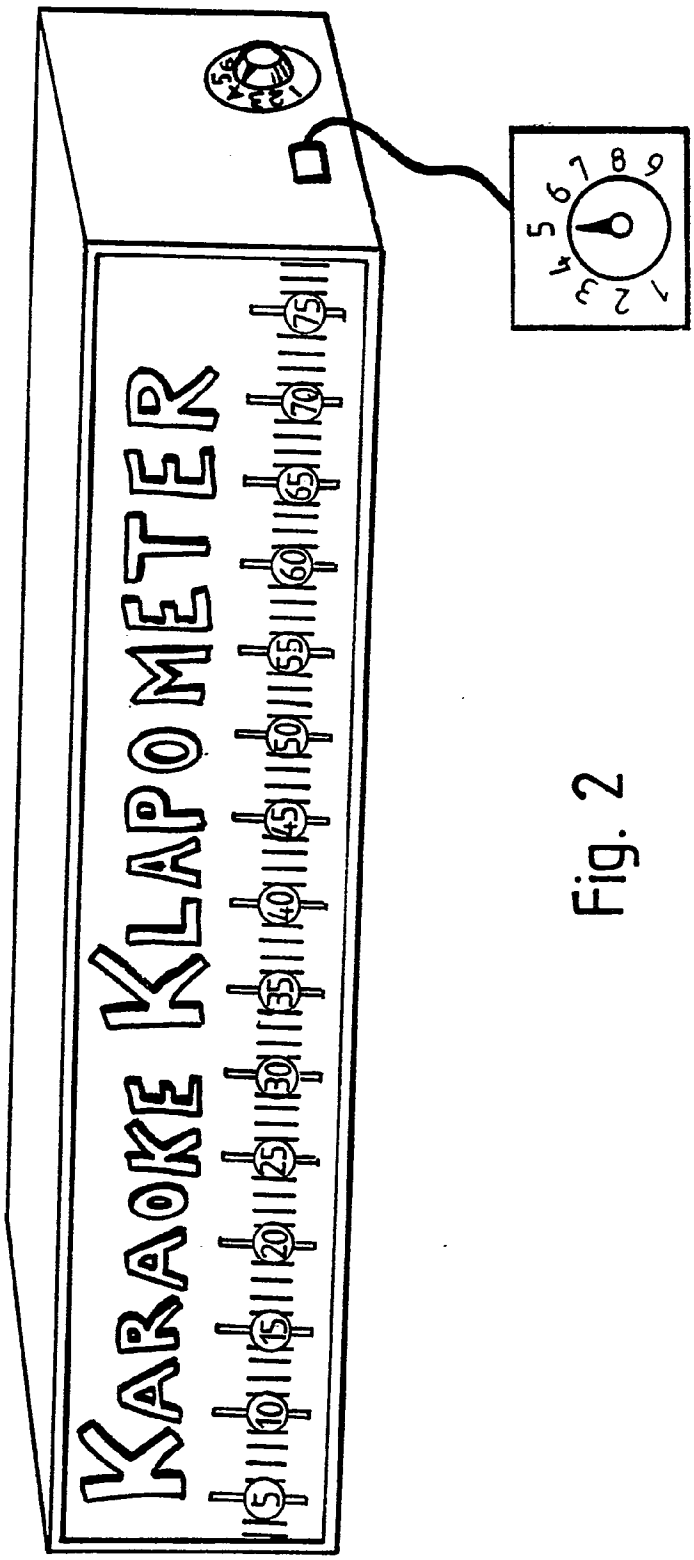
KARAOKE KLAPOMETER
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Fig. 2

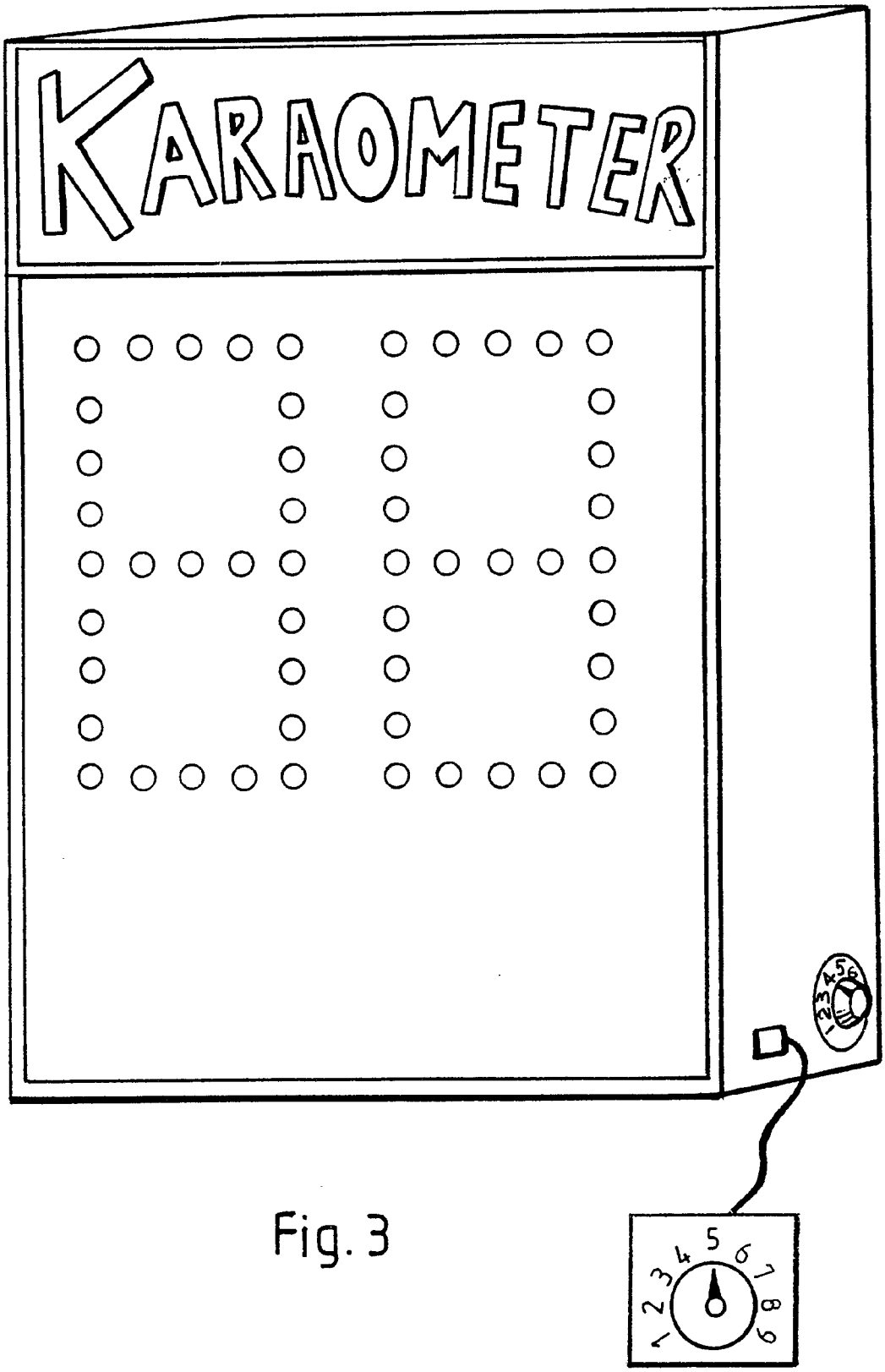

Fig. 3

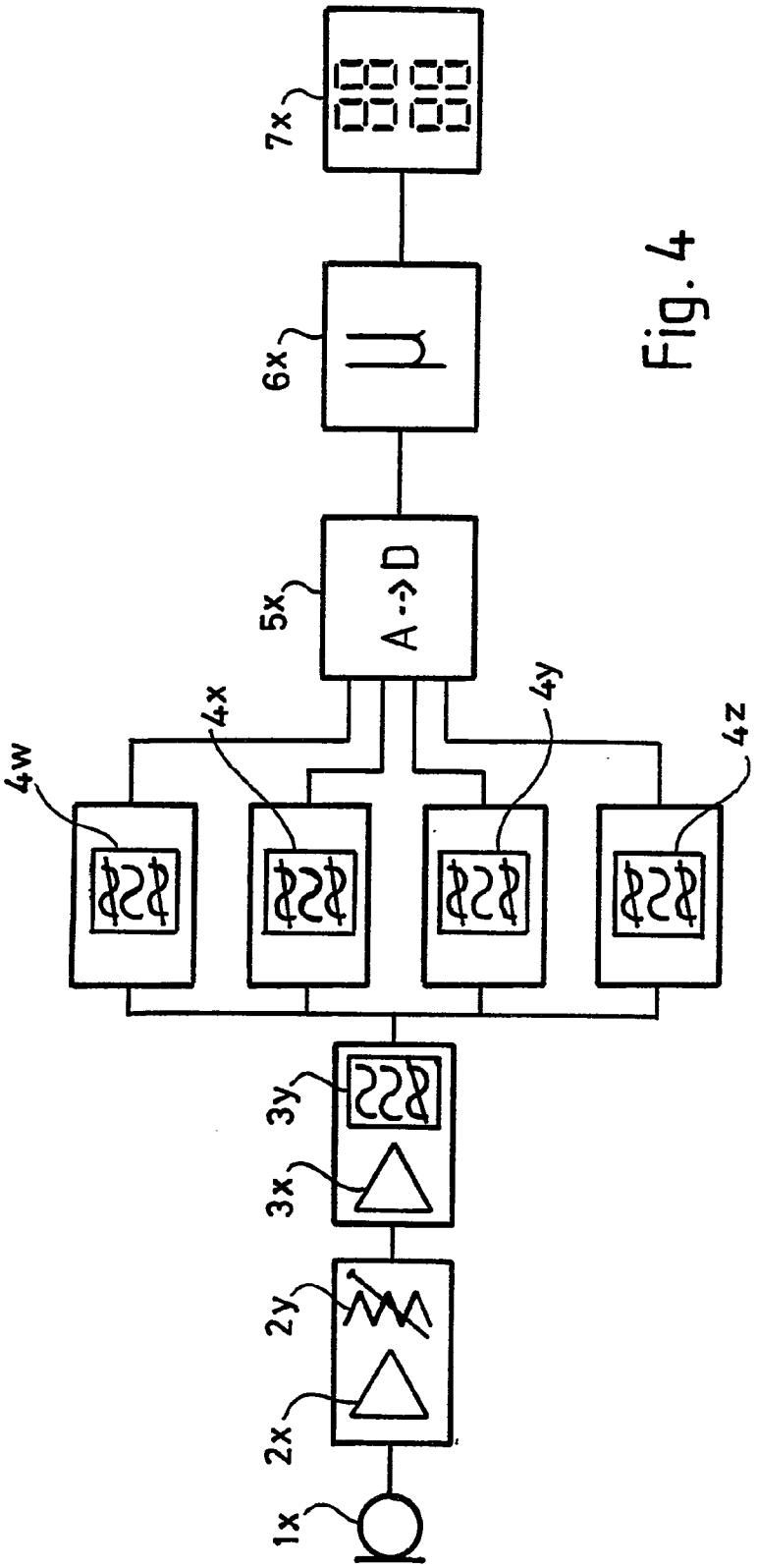

Fig. 4

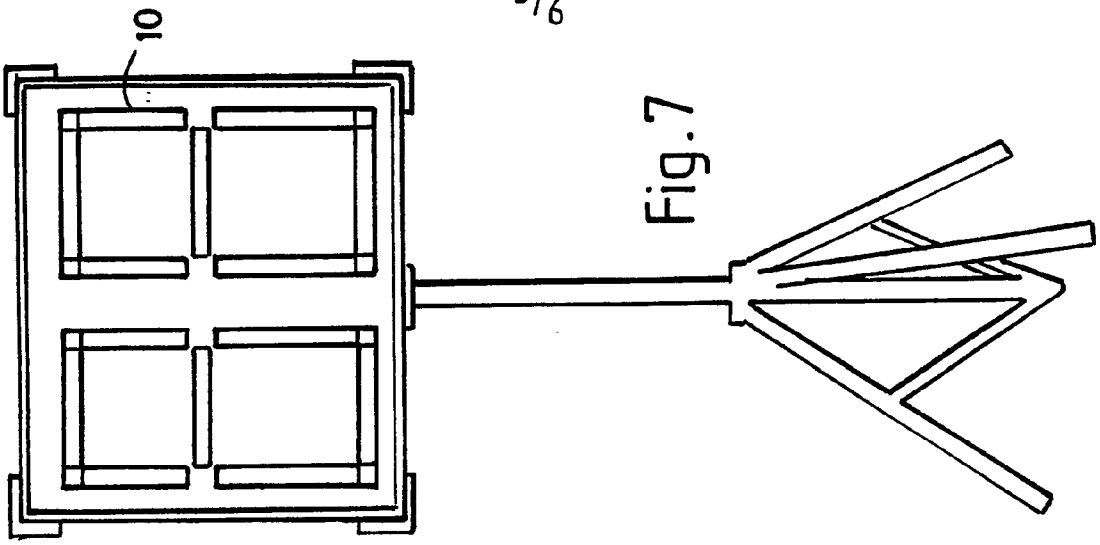

Fig.7

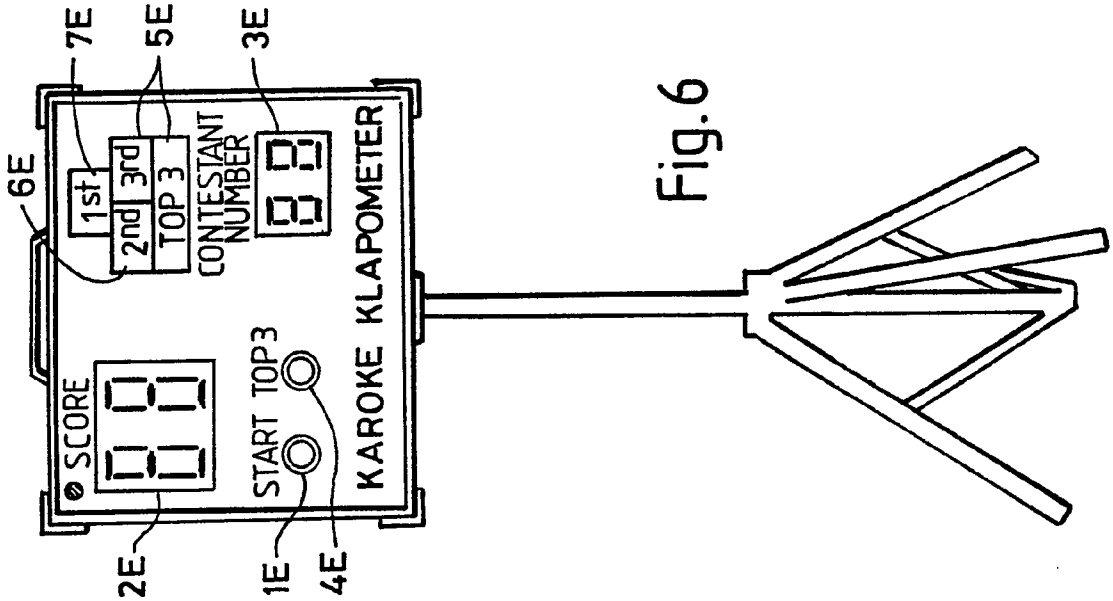

Fig.6

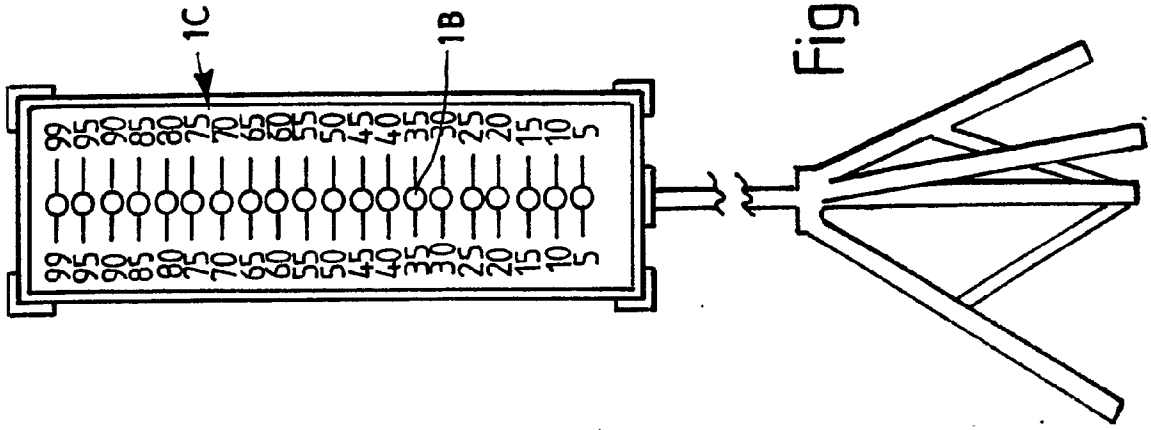

Fig.5

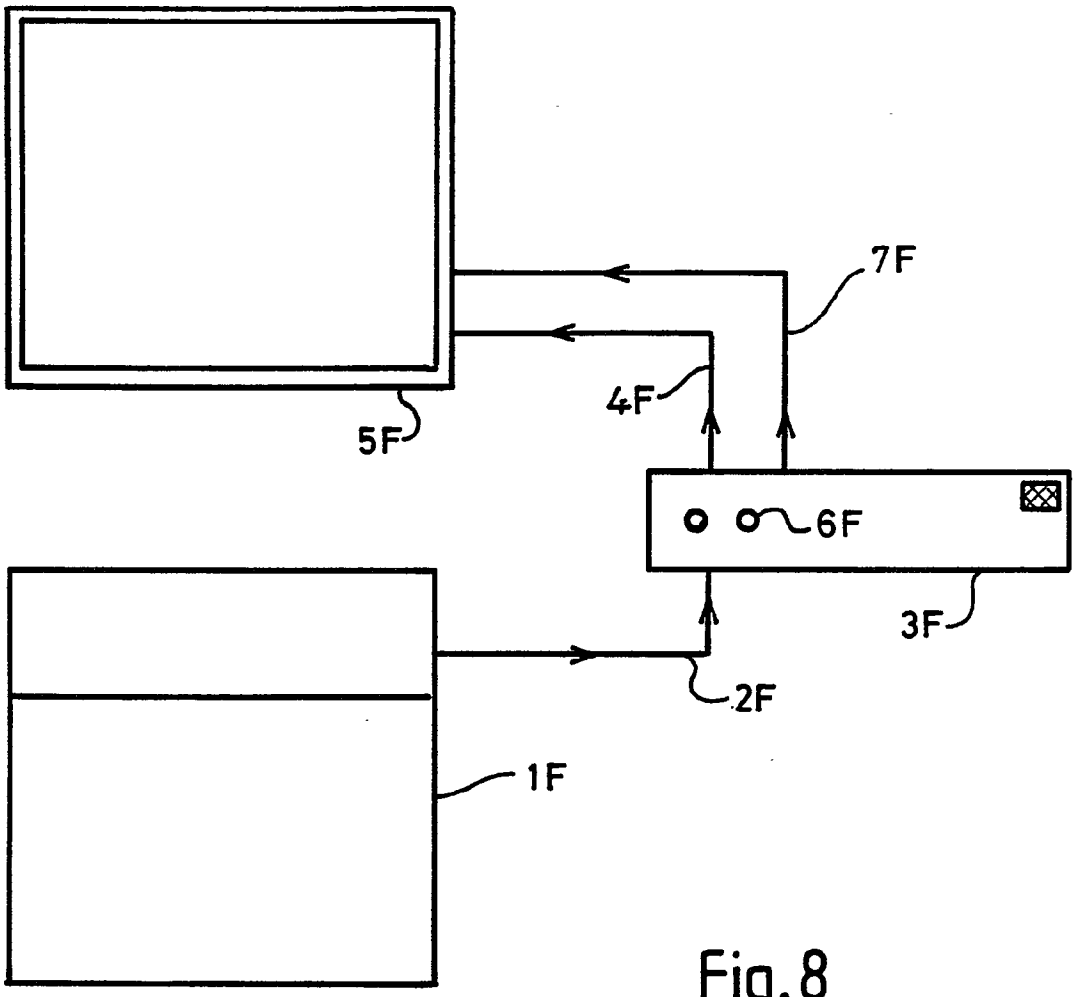

Fig.8

IMPROVEMENTS RELATING TO MEASURING DEVICES

The invention relates to a measuring device for use in talent competitions or with an entertainment means and particularly, but not exclusively, for use with a Karaoke machine.

Karaoke machines have been available for some time and they typically comprise a means whereby a sound recording can be played for the purpose of accompaniment by an amateur singer. Thus these singalong machines, as they are known, enable an individual to sing the words to a song recording played on a Karaoke machine. Karaoke machines are typically equipped with echo and reverb control so as to enhance a singer's voice and therefore produce a more professional sound.

Karaoke machines have become so popular that competitions are now organized whereby participants compete with each other to produce the best performance when singing along with the Karaoke machine. It is known for public houses and various clubs around the world to have Karaoke nights which feature such competitions. However, the judging of such competitions is extremely difficult, it is often carried out by a panel of judges or a single individual. As will be appreciated the opinion of the judges does not always

reflect that of the audience and therefore audience appreciation of a Karaoke competition may in some instances be disregarded.

It is an object of the invention to encourage audience participation and assess audience appreciation during a talent competition or the operation of a Karaoke machine and in particular during the judging of a talent or a Karaoke competition.

According to a first aspect of the invention there is therefore provided for use in or with a Karaoke machine or a talent competition a sound sensing device which device is adapted to sense audible audience response to a Karaoke or a talent performance and to convert the sensed response into a calibrated signal for display on a visual display means.

Preferably the visual means clearly shows the amount of audience response, measured by way of sound, to any given performance.

Preferably the sound sensing device includes a micro-processor which micro-processor can preferably store information relating to a pre-determined number of performances and competitions, and relay said information at any selected time to a user of the machine. It will be understood that this facility will be advantageous in comparing and verifying competition results.

In the instance where a micro-processor is included in the sound sensing device there will also preferably be included an analogue/digital converter.

Preferably the visual means will include any conventional visual indicating means such as a lamp, LED display or indeed any other display which can be activated as a result of the generation of either an analogue or a digital signal.

Preferably the sensing device is fitted with a sensing control in order to adjust the sensitivity of the sound sensing device. This will be particularly useful when the device is used in different environments because different environments will be of a different size and have different acoustics, further the size of audience will vary from site to site. Such a sensing control will therefore ensure that the sensing device always operates within the limits of its calibration.

Preferably the sensing control is coupled to the micro-processor so that when storing information relating to each individual performance account can be taken of the sensing status of the device.

Preferably the device includes a printer which is adapted to print information relating to at least one performance such as a ticket indicating contestant number and corresponding score, or alternatively all contestant numbers and scores. In a further preferred modified version of the invention the printer is adapted to print at least one certificate relating to at least one performance and ideally a winning certificate for the best performance as measured by the device.

According to a yet further aspect of the invention there is provided for use in or with a Karaoke machine

or a talent competition a sound sensing device which is adapted to distinguish between different types of audible audience response and to use at least one pre-selected type of said response to generate a calibrated signal for display on a visual display means.

Preferably the sound sensing device includes a filter means, ideally a bandpass filter means, which divides the audio spectrum into a number of sections, preferably four. In a preferred embodiment the sections have centre frequencies of 1.5KHz, 3KHz, 6KHz and 12KHz.

Further a means is also preferably provided for sampling and averaging the outputs of the bandpass filters which means is preferably a four channel analogue to digital converter. However, it will be understood that where a greater number of centre frequencies are used, such as n frequencies, a corresponding n channel analogue/digital converter will be used.

Information relating to each section of the audio spectrum, and so emanating from each channel, is processed using a micro-processor so as to indicate a score, which score is proportional to audible audience response and in particular to a pre-selected form of audible audience response, such as clapping. The means whereby the micro-processor processes the information may be varied, for example scoring may be weighted so that information coming from a particular channel receives a higher number of marks than information coming from any other channel.

Preferably the sound sensing device also includes a means which measures the time taken for a particular score to be achieved. This information is stored in the micro-processor and in the instance where more than one contestant achieves a given score the contestants are distinguished by the time taken to achieve the given score and ordered accordingly. Thus, for example where two individuals achieve the same highest score the individual reaching the highest score in the shortest possible time is deemed to be the winner.

Preferably the device includes a printer which is adapted to print information relating to at least one performance such as a ticket indicating contestant number and corresponding score, or alternatively all contestant numbers and scores. In a further preferred modified version of the invention the printer is adapted to print at least one certificate relating to at least one performance and ideally a winning certificate for the best performance as measured by the device.

Although a preferred embodiment of the invention has been described with reference to the division of the audio spectrum into four sections having particular operating frequencies, it is to be understood that the spectrum may be divided into any desired number of sections having any desired operating frequencies.

Although the invention has been described with specific reference to a Karaoke machine it is to be understood that the term Karaoke machine is intended to include any entertainment machine which allows a performer to be accompanied by a recording during his performance,

regardless of whether the accompaniment is an audible or a visual accompaniment.

Further, the invention also relates to an apparatus for use in a competition such as a talent competition where audience response is used to judge entrants in the competition.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings wherein;

Figure 1 represents a diagrammatic view of a sensing device in accordance with the invention;

Figure 2 represents a perspective view of one embodiment of the invention;

Figure 3 represents a perspective view of an alternative embodiment of the invention;

Figure 4 is a block diagram of a further embodiment of the invention;

Figure 5 is a front elevation view of a visual display means in accordance with the invention;

Figure 6 is a front elevation view of a further visual display means in accordance with the invention;

Figure 7 is a front elevation view of a yet further visual display means in accordance with the invention; and

Figure 8 is a block diagram illustrating the operation of a further modification of the invention.

Turning to the Figures and firstly to Figure 1, there is shown a sound sensing device which includes a sound sensing means 1. Sensing means 1 is a conventional sound sensing device that converts typically the averaged ambient sound level into a voltage level which voltage level is proportional to the sound. Sound sensing means 1 is functionally coupled via lead 1a to an amplification/averaging means 2.

Means 2, where appropriate, amplifies the incoming signal from the sound sensing means 1 and where appropriate, averages the signal. Means 2 is coupled via lead 2a to an A/D converter 3.

The provision of means 3 enables a voltage signal generated by means 1 to be converted into a digital signal which can then be fed to and read by a micro-processor 4 or any other digital responsive device.

Micro-processor 4 is suitably adapted to store incoming information and also uses information to activate visual indicator means 5. To this end, micro-processor 4 is coupled via lead 4a to indicator means 5.

In Figure 1 micro-processor 4 is coupled via two leads 4a to a first indicator means 5a and a second indicator means 5b. It will be understood that the number and nature of indicator means 5 can be varied according to requirements.

In an alternative embodiment of the invention the signal generated by the sound sensing means 1, which has been passed through the amplification/averaging means 2, may pass directly via lead 2b to visual indicator means 5. In this embodiment it will be understood that the visual indicator means include a device that can convert the voltage signal into the activation of a visual display.

Ideally the sound sensing device is provided with a sensing control which enables the user to alter the sensitivity of the sound sensing means 1. This will ensure that the sound sensing device always operates within its calibrated limited. Where a sound sensing control is provided in an embodiment of the invention which includes a micro-processor 4 the sensing control will be functionally coupled to the micro-processor 4 so that the micro-processor 4 can note the operating sensitivity of the device and, where appropriate, use this information in the handling and comparison of performances.

Referring now to Figure 4, there is illustrated in diagrammatic form a further embodiment of the invention which embodiment concerns the provision of a sound sensing device which is adapted to distinguish between different types of audible audience response and to use at least one pre-selected type of response to generate a calibrated signal for display on a visual display means as afore described and as further to be described hereinafter.

The sound sensing device includes a microphone 1x which may be either built in to the device or provided with

attachment cabling for use in a remote location. The responsive range of the microphone will be suitable for use in a pre-selected location. The noise signal generated by microprocessor 1x is passed to a variable amplification means 2x. This is to ensure that there is enough overall signal gain to cover any type of venue.

The device is also provided with a volume control means 2y whereby responsiveness of the microphone can be adjusted.

The device also includes a second amplification means 3x and a bandpass filter 3y arranged in series with the aforementioned features. The filter 3y may be, for example, a digital signal processor type of filter or an OP amp type of filter. The purpose of this filter is to remove the very low frequency noise from 0 to 300 Hertz and also the very high frequency noise from 16KHz to 20KHz. Thus a pre-selected portion of the audio spectrum is selectively filtered for the purpose of further processing.

Downstream of means 3x and filter 3y there is provided a number of filters 4w, 4x, 4y, 4z which are arranged in parallel. Filters 4w, 4x, 4y and 4z are set to allow certain bands of frequencies through whilst rejecting others. These filters have variable gain so as to allow them to be weighted against certain frequencies. The filtering characteristics of the filters are ideally adjustable so as to cater for different applications. Filters 4w, 4x, 4y, and 4z can either be, for example, a digital signal processor or a standard OP amp type depending upon applications.

In use, the filtering operates as follows. The noise coming from the audience will consist of typically shouts, screams, whistles, and clapping. These noises are concentrated in the lower section of the audio spectrum, mostly in the band between 300Hz and 3KHz. The sound sensing device divides the audio spectrum, using filters 4w, 4x, 4y and 4z, between 300Hz to 16 KHz into four sections with centre frequencies of 1.5KHz, 3KHz, 6KHz and 12KHz.

Apart from clapping, all the other noises tend to be of a sinusoidal nature. Clapping however is, by its nature, an extremely sharp sound and its leading edge is that of a square wave. By electrical principles a square wave is made up of an infinite number of odd harmonics, for example, a 300Hz square wave is made of a 300Hz sign wave plus a 900Hz sign wave plus a 1500Hz sign wave plus a 2100Hz sign wave etc ad infinitum.

Therefore, for example, if filters 4w, 4x, 4y and 4z have centre frequencies of 300Hz, 900Hz, 1500Hz, 2100Hz with a narrow band width then if they are exposed to a 300Hz square wave, since the square wave is made up of a number of sign waves at the chosen centre frequencies, we would expect to see outputs on each channel connected to each filter. Alternatively, a whistle at a frequency of 2100Hz for example would only produce an output on the 2100 filter. It can be seen that a clapping noise would successfully by-pass all four filters whilst a whistle would only by-pass one filter. Therefore by choosing suitable frequencies for the filters 4w, 4x, 4y and 4z the filters can be adapted to respond to only certain sounds, such as a whistle, so ensuring that certain sounds only by-pass

one or possibly two filters, whereas clapping will by-pass all four filters.

The filtered noise from filters 4w, 4x, 4y and 4z is passed to an averaging system that effectively converts the alternating frequencies to D/C level so that the signals can be passed on to a suitable analogue to digital converter 5x. Alternatively, if a digital signal processor was used then this operation could be done on board the filter.

The averaging system can consist of anything from a single diode pump circuit with suitable values to a full scale digital signal processor.

The relatively steady D/C levels from filters 4w, 4x, 4y and 4z as mentioned, are passed to converter 5x. The voltage of the inputs to the converter 5x can vary from between 0 volts to a level set by the gain control and the maximum input noise. In practice, the sound sensing device has a voltage swing of 2-3 volts. This voltage swing is converted by converter 5x into either an '8', '12' or '16' bit number depending upon the application. For example, if we have a 2.55-volt swing and we used an 8 bit A/D converter, each 0.01 volt swing would represent a '1', therefore if the output voltage from the one of the filter sections was 1.00 volt when averaged and read then this particular channel would present the micro-processor 6x with a number '100'.

Micro-processor 6x reads the A/D converter 5x and takes in all the information from each of the filters, an algorithm is performed on all the incoming information and the final value is displayed on display means 7x.

The relevant calculation can either be simply adding all the channels together and dividing by the number of channels from which a signal is generated or, weighting some of the incoming signals before calculation takes place.

A further example of calculating information is as follows: for example, if the filter channels are across the audio spectrum and are very narrow so that there are eight filter channels, as opposed to four, and the A/D converter 5x outputs information representing a number from 0 to 255 to the main micro-processor 6x, clapping may output, for example, the value of '50' on all channels, but a loud shout outputs '255' (maximum) on channel 1, and a '100' on another channel, say channel 2. If we look at the numbers achieved, clapping achieves a number of '50 x 8' equalling '400', but the loud noise only achieves '255 + 100' which equals '355'. Therefore the loud shout records high on two channels only but the clapping records low on all eight channels producing a higher number.

In summary, clapping will result in output from all channels whereas shouting, screaming or whistling produces output on only a fraction of the channels. The resultant sums of the different types of audience appreciation gives a higher score for clapping than any other form of appreciation.

Micro-processor 6x also includes the capacity to monitor the time taken for a given maximum score to be achieved. Thus in the instance where more than one individual achieves the maximum high score, their scores can be distinguished on the basis of the time

taken to achieve such a score. Thus the winner would be the individual who achieved the highest score in the lowest possible time.

As has already been mentioned the visual indicator means 5 can take any desired form and in Figure 2 there is illustrated a device in accordance with the invention which is sold under the Trade Mark KARAOKE KLAPOMETER which device includes a series of calibrated lamps that operate sequentially as the sound sensing means 1 senses increasing levels of noise. In a variation of this embodiment there is provided a moving indicator which indicator travels along the calibrated numbers in accordance with the sensed noise levels.

Turning to Figure 3 there is shown an alternative embodiment of the invention which is sold under the Trade Mark KARAOMETER. This embodiment comprises two sets of lamps each set arranged in a figure '8' configuration, which lamps can be selectively activated so as to display any two-digit number. Thus the score of a performer can be displayed from one to ninety-nine according to the noise generated by an audience.

Figures 5, 6 and 7 show three further visual display means in accordance with the invention and it will be understood that these display means are adapted to be plugged into a sound sensing device as above described. The display shown in Figure 5 comprises a linear array of light bulbs 1B and an adjacent calibrated score indicator means 1C. When the visual display means is first activated all bulbs 1B light up for three to four seconds after which the bulbs are switched off and the display means reads '0'. Following a performance

successive bulbs are illuminated in accordance with audience response.

The visual display means illustrated in Figure 7 comprises a number of elongate bulbs 1D arranged in a figure-eight configuration. Two figure-eight configurations are shown. When the means is activated all bulbs 1D are illuminated for three-quarters of a second then the bulbs are switched off to signify a score of '0', or alternatively a single figure-eight may be illuminated to show the figure '0'.

Referring now specifically to the visual display means shown in Figure 6, it can be seen that there are a number of features which will now be described in greater detail. A start button 1E is provided which when depressed sets the machine "listening mode". This means that the sound sensing device is activated so as to record and suitably damp the current noise level in real time. At the end of a pre-set period, between ten to fifteen seconds, the machine will automatically end this sequence and display the highest achieved noise level on score indicator means 2E. The score on indicator means 2E will be present for a few seconds and then the indicator means will be set to display the score '0'. At the same time, contestant number means 3E will display the next contestant number '1'.

The high noise level noted on indicator means 2E prior to the performance of contestant one is used to determine the background noise in the venue. This is an important factor to be determined since it is expected that background noise will vary during the course of a given competition and the extent to which background

noise contributes to score determination must be considered. In sophisticated forms of the invention continuous monitoring of background noise will take place throughout the period of a competition and scores will be adjusted accordingly. Whereas in other embodiments of the invention a background noise calculation means will be provided so that at given points in time a user can manually activate the sound sensing device to take a recording of background noise and use the recording to adjust a preceding or proceeding performance according to requirements.

When a performance has been concluded the sound sensing device will sense the amount of audience appreciation, by way of noise, and in accordance with the previously described working of the invention a score will be shown on means 2E. Pressing the 'Top 3' button 4E places the device in "scoring mode". On the first press the top three lamp 5E is illuminated and the number of the contestant placed in third position will be shown on means 3E. Pressing 'Top 3' button 4E again causes the top two lamp to be illuminated and the number of the contestant placed in second position will be shown on means 3E. Pressing 'Top 3' button 4E again causes the first lamp 7E to be illuminated and the number of the contestant placed in first position is shown on means 3E. Pressing the 'Top 3' button 4E again repeats this process.

In the event that 'Top 3' button 4E is not depressed during a ten to fifteen second period the machine exists "scoring mode" and reverts to its previous status.

In the event that 'Top 3' button 4E is pressed during a "listening mode" the "listening mode" is terminated prematurely and the highest score so far is displayed on means 2E along with contestant number on means 3E.

As mentioned above, if more than one individual achieves the maximum, or highest score the device automatically performs judgement by distinguishing the individual who scored the highest score in the least possible time. In less sophisticated versions of the machine a manual means will be provided so as to activate this judging facility.

Further, the device is provided with a 'set' button (not shown) which activates the device so that the gain control can be adjusted to an ambient level. In this mode the machine will display the current noise level, by way of indicating a score, but will not record this score, or indicate the contestant number on means 3E. This phase will be active for one minute unless any other button is pressed. Pressing any other button will cancel this mode and the machine will revert to its previous status.

In the event that this button is pressed during "listening mode" the listening mode will be cut short and the highest score to date recorded, and the contestant number increased by one, as if the listening phase had finished as normal.

To indicate that the unit is in the set up mode, means 3E shows figures '8 8' flashing on and off.

Referring now to Figure 8, there is illustrated in diagrammatic form an improved version of a sound sensing device which has particular application in or for use with a graphic Karaoke machine. As will be understood, graphic Karaoke machines comprise a monitor on which visual images, such as the words of a given song, are displayed as a piece of music is played. A standard Karaoke machine 1F typically includes a loader unit for storing a number of sound recordings, and a decoder unit for decoding the information stored in digital form on the sound recordings. Decoded information from machine 1F is fed via line 2F to a sound sensing device 3F as above described. During the period of a performance decoded information entering device 3F, via line 2F, is transferred via line 4F to a conventional monitor 5F. Upon the termination of a performance, measured by way of a change in the nature of decoded information passing through device 3F, or via a manual interrupt means such as a button 6F provided on device 3F, scoring information is sent via line 7F to monitor 5F. Scoring information comprises a graphic illustration of a scoring device which may take the form of bar charts or any other indicator means. The illustration on monitor 5F may be in dynamic form. For example, after a performer or contestant has finished a performance, audience response is measured as afore described using device 3F and the increase in score is displayed on monitor 5F as a graphic and dynamic display showing an increase in score corresponding to audience appreciation. Further, information relating to the top three scores may simultaneously be displayed on monitor 5F. Once the appreciation period has finished device 3F stops sending scoring information via line 7F to monitor 5F

and normal operation of the Karaoke machine is resumed. In an alternative embodiment of the invention sensing device 3F is adapted to send information to monitor 5F using line 4F. It will be understood therefore that in this embodiment information from machine 1F is prevented from reaching monitor 5F during the scoring period.

Each of the above described embodiments of the invention are offered for sale with a printing device which is coupled to or integral with the sound sensing device so as to print information relating to the competition. In one embodiment the printer prints a ticket for each contestant showing the contestant number and, where appropriate, corresponding score. In what may be known as a deluxe version the printer prints a winner's certificate for the winner and, where preferred, at least one certificate for at least one runner-up.

It will be understood that the nature and number of visual display devices to be used in combination with the sensing means are too numerous to mention but all fall within the scope of the invention.

It can therefore be seen that the invention provides for a sound sensing device which is for use in or in combination with an entertainment machine such as a singalong Karaoke machine.

CLAIMS

1. A sound device for use in or with a talent competition machine wherein said device is adapted to detect audible audience response to a talent performance and to convert the detected response into a calibrated signal for display on a visual display means.

2. Sound device according to Claim 1 wherein said talent competition machine is a karaoke machine.

3. Sound device according Claim 1 wherein there is further provided a microprocessor which stores information relating to a predetermined number of performances for the purpose of recall.

4. Sound device according to Claim 3 wherein the microprocessor is coupled to an analogue/digital convertor.

5. Sound device according to Claim 1 wherein the visual display means includes a lamp array.

6. Sound device according to Claim 1 wherein the visual display means included an LED display.

7. Sound device according to Claim 1 wherein the device is further provided with a threshold control means in order to adjust the sensitivity of the sound device.

8. Sound device according to Claim 7 wherein the threshold control means is coupled to the microprocessor whereby when storing information relating to each performance account is taken of the status of the threshold control means so as to take account of background noise.

9. A sound device according to any preceding Claim wherein the device is further provided with a sound selection means which is adapted to distinguish between different types of audible audience response and to use at least one pre-selected type of said response to generate a calibrated signal for display on said visual display means.

10. A sound device according to Claim 9 wherein the sound selection means includes a filter means.

11. A sound device according to Claim 10 wherein the filter means includes a band pass filter which divides the audio spectrum into a number of pre-selected sections.

12. A sound device according to Claim 11 wherein said sections have centre frequencies of 1.5 kilohertz, 3 kilohertz, 6 kilohertz and 12 kilohertz.

13. A sound device according to Claims 11 or 12 wherein there is further provided an averaging means for sampling and averaging the outputs of the band pass filters.

14. A sound device according to Claim 13 wherein the averaging means is a four channel analogue to digital convertor.

15. A sound device according to Claims 9 to 14 wherein the microprocessor generates a score for each performance which is proportional to audible audience response of a pre-selected form such as clapping.

16. A sound device according to Claim 15 wherein the microprocessor is adapted to distinguish information from different sections whereby information from a pre-selected section receives a higher number of marks than information from any other section.

17. A sound device according to any preceding Claim wherein there is further provided a timing means which records the amount of time each performer takes to achieve a particular score.

18. A sound device according to Claim 17 wherein a microprocessor records said time and in the instance where two performances are accredited the same score then the performance with the lowest recorded time for achieving said score is designated priority.

19. A sound device according to any preceding Claim wherein the device is further provided with a printer adapted to print information relating to each performance.

20. A sound device according to Claim 19 wherein the printer is adapated to print certificates relating to said performance.

Amendments to the claims have been filed as follows :

CLAIMS

1. A sound device for use in or with a talent competition machine wherein said device is adapted to detect audible audience response to a talent performance and to convert the detected response into a calibrated signal for display on a visual display means characterized in that said device is provided with a sound selection means which is adapted to distinguish between different types of audience response and to use at least one pre-selected type of said response to generate said calibrated signal for display on said visual display means.

2. Sound device according to Claim 1 wherein said talent competition machine is a karaoke machine.

3. Sound device according Claim 1 wherein there is further provided a microprocessor which stores information relating to a predetermined number of performances for the purpose of recall.

4. Sound device according to Claim 3 wherein the microprocessor is coupled to an analogue/digital convertor.

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6. Sound device according to Claim 1 wherein the visual display means included an LED display.

7. Sound device according to Claim 1 wherein the device is further provided with a threshold control means in order to adjust the sensitivity of the sound device.

8. Sound device according to Claim 7 wherein the threshold control means is coupled to the microprocessor whereby when storing information relating to each performance account is taken of the status of the threshold control means so as to take account of background noise.

9. A sound device according to Claim 1 wherein the sound selection means includes a filter means.

10. A sound device according to Claim 9 wherein the filter means includes a band pass filter which divides the audio spectrum into a number of pre-selected sections.

11. A sound device according to Claim 10 wherein said sections have centre frequencies of 1.5 kilohertz, 3 kilohertz, 6 kilohertz and 12 kilohertz.

12. A sound device according to Claims 11 or 11 wherein there is further provided an averaging means for sampling and averaging the outputs of the band pass filters.

13. A sound device according to Claim 12 wherein the averaging means is a four channel analogue to digital convertor.

14. A sound device according to Claims 9 to 14 wherein the microprocessor generates a score for each performance which is proportional to audible audience response of a pre-selected form such as clapping.

15. A sound device according to Claim 14 wherein the microprocessor is adapted to distinguish information from different sections whereby information from a pre-selected section receives a higher number of marks than information from any other section.

16. A sound device according to any preceding Claim wherein there is further provided a timing means which records the amount of time each performer takes to achieve a particular score.

17. A sound device according to Claim 16 wherein a microprocessor records said time and in the instance where two performances are accredited the same score then the performance with the lowest recorded time for achieving said score is designated priority.

18. A sound device according to any preceding Claim wherein the device is further provided with a printer adapted to print information relating to each performance.

19. A sound device according to Claim 18 wherein the printer is adapated to print certificates relating to said performance.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

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Relevant Technical fields

(i) UK Cl (Edition L) G1G (GSA, GSX)

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Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASE: WPI

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Documents considered relevant following a search in respect of claims 1-20

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2184542 A (ELECTROMUSIC)	1 AT LEAST
X	GB 2072846 A (SOUND ATTENUATORS)	1 AT LEAST
X	EP 0122074 A2 (DUPONT)	1 AT LEAST

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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